

SUPPORT FOR THE AMENDMENT

Support for the amendment to claim 3 is found on page 8, lines 2-4 of the specification. No new matter would be added to this application by entry of this amendment.

Upon entry of the amendment, claims 3 and 12-16 will remain active in this application.

REQUEST FOR RECONSIDERATION

The claimed invention is directed to a method of antifouling and washing hard surfaces.

In the claimed invention, re-deposition of fouling, very often observed in toilet bowls, can be prevented, even with washing several times, with maintenance by initial antifouling. In particular, toilet bowl surfaces are treated with an antifouling detergent composition comprising a polymer having a specific monomer ratio. Such a monomer ratio based polymer is advantageous and provides for the prevention of the re-deposition.

The rejections of claims 3 and 12-16 under 35 U.S.C. § 103(a) over various combinations of Pucci et al. U.S. 5,872,088, Aubay et al. U.S. 6,703,358 and Aubay et al. U.S. 6,593,288 are respectfully traversed.

No Suggestion Of The Claimed A/A+B Ratio Of 2/3 To 0.9

Neither Pucci et al. nor Aubay et al. U.S. '358 describe a polymer in which the amine containing monomer has two alkylene groups $R^1R^2C=C(R^3)-X-$, as claimed. According to Aubay et al. U.S. '358, each group R_2 , R_3 and R_4 of formula (I) is a linear or branched C_{1-4} alkyl group. A second polymerizable alkylene group is not suggested. Accordingly, neither Pucci et al. nor Aubay et al. U.S. '358 can suggest the claim limitation of a difunctional

monomer (A) in an amount of 10-90 mol% and a ratio of A/A + B of 2/3 to 0.9 since neither reference describes the claimed component (A). It is axiomatic that a ratio of A/ A+B can not be described by references which fail to described monomer (A).

Aubay et al. U.S. '288, generally describes polymer compositions, **for cleaning hard surfaces** in which the ratio of difunctional amine monomer (a) to hydrophilic monomer (b) is 60/40 to 5/95 (column 3, lines 16-17), preferably 50/50 to 10/90 (column 4, lines 28-29). For the purposes of cleaning, the ratio is generally 60/40 to 5/95 (0.6 to 0.05), but preferably 50/50 to 10/90 (0.5 to 0.1). A composition having a ratio of A/A+B of 2/3 to 0.9 (0.66 to 0.9) is not suggested in this reference.

In contrast, the claimed invention is directed to a method of antifouling and washing in which the polymer is a copolymer of a quaternized amine monomer (A) having at least two alkylene groups and a second polymerizable monomer (B) in which the ratio of monomer (A)/monomer (A) + monomer (B) is from 2/3 to 0.9. Thus, for the purposes of anti-fouling and washing, applicants have discovered that a ratio which exceeds 60/40 is valuable.

Such a discovery is not obvious as the claimed range is outside the range of the reference which identifies a preference for **a ratio within** the disclosed range.

However, while it may ordinarily be the case that the determination of optimum values for the parameters of a prior art process would be at least *prima facie* obvious, that conclusion depends upon what the prior art discloses with respect to those parameters. Where, as here, the prior art disclosure suggests the **outer limits of the range** of suitable values, and that **the optimum resides within that range**, and where there are indications elsewhere that in fact **the optimum should be sought within that range**, the determination of optimum **values outside that range may not be obvious**. We think it is not on the facts of this case (*In re Sebek*, 465 F.2d 902, 175 USPQ 93, 95 (CCPA 1972)).

As the only reference which describes a polymer having two alkylene groups does so at a ratio which does not exceed 60/40 (0.6), but preferably 50/50 to 10/90, the claimed method using a polymer in which the A/A+B ratio is 2/3 (0.666) to 0.9 is not *prima facie*

obvious as the claimed ratio goes beyond the disclosed range, when a preferred range is disclosed within. The claim limitation of an A/A+B ratio of 2/3 to 0.9 is not suggested in the cited references.

The examiner cites to *Titanium Metals Corp of America v. Banner* 778 F.2d 775, 227 USPQ 773 (Fed. Cir 1985) for the position that ranges which do not overlap with the prior art but which are close enough that one skilled in the art would have expected them to have the same properties are *prima facie* obvious.

Applicants note that *Titanium Metals* found obvious a claimed composition, where the differences from the reference composition was "close enough."

Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.). M.P.E.P. §2144.05(I)

In the *Titanium Metals* case, the analysis did not consider whether there was a more explicit disclosure of **a preferred range which was within the broad range** of the reference. Unlike *Titanium Metals*, Aubay U.S. '288 describes a broad range of 60/40 to 5/95 and a preferred amount of from 50/50 to 10/90. Thus, while the reference describes that a ratio of 60/40 will work, the preference is for an ratio which is lower, such as 50/50. The preference for an amount of 50/50 to 10/90 is an express teaching away from going beyond the broadest disclosed ratio of 60/40. Under these circumstances a ratio of 2/3 is **not close enough** to the disclosed ratio of 0.6. Those of ordinary skill in the art would recognize that Aubay et al. disclosure of a preference for a ratio for cleaning which is less than 60/40 to preclude motivation to use a ratio which exceeded 60/40. Quite simply, when a reference describes a preference within a broad range, those of ordinary skill in the art would not be motivated to go outside the broad range. Thus the claimed range which is outside of the upper limit of 60/40 is not *prima facie* obvious.

Moreover, applicants have discovered an improved antifouling property when the ratio is as claimed, as compared with when the ratio of A/A+B is only 0.5.

As evidence of the improved anti-fouling properties when using a polymer as claimed, applicants have previously submitted the declaration of Mr. Yosuke Komatsu, a named inventor of the above-identified application.

Mr. Komatsu prepared further polymer samples and tested same as in example 2 of the above-identified application.

The Komatsu declaration provides additional comparison of antifouling performance of polymer F, a 50/50 mixture of diallyldimethylammonium chloride/maleic acid copolymer having a weight average molecular weight of 20,000 with antifouling performance of polymers A and B, each with a 2/3 ratio of diallyldimethylammonium chloride to maleic acid. For the examiner's convenience the data from the Komatsu declaration is reproduced below:

Table 2-1

		Fouling prevention products										Comparative products				
		2-1	2-2	2-3	2-4	2-5	2-6	2-7	2-8	2-9	2-10	2-11	2-12	2-13	2-14	2-15
Concentration of fouling liquid (ppm)	Polymer A	1.0	1.0	1.0	1.0						0.5					
	Polymer B					0.5	1.0	5.0	2.0							
	Polymer C											0.5				
	Polymer D												0.5			
	Polymer E													0.5		
	Polymer F		1.0												0.5	0.5
	Surfactant A			1.0												
	Surfactant B				1.0	0.5	0.5	0.5	1.0							
	Surfactant C			5.0						2.0						
	Surfactant E										3.0					
Antifouling performance	After 2 months	Investigation	○	○	○	○	△	○	○	○	○	×	○	△	○	△
		water-line region	○	○	○	○	○	○	○	○	○	×	△	△	△	△
		water-sealed region	○	○	○	○	○	○	○	○	○	△	×	×	×	○
		ethylene glycol	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Polymer F: Diallyldimethylammonium chloride/maleic acid/sulfur dioxide (molar ratio 50/50/0) copolymer, a weight-average molecular weight of 20,000

Comparative product 2-5, formulated with a polymer having an A/A+B ratio of only 0.5 produced inferior anti-fouling performance relative to inventive product 2-9, a formulation having an A/A+B ratio of 2/3, at the same concentration of polymer. Inventive products 2-1 to 2-8 further demonstrate superior anti-fouling performance when the A/A+B ratio is from 2/3 to 0.9.

Applicants further note that examples 1-1 to 1-9 using polymers A and B at molecular weights of 30,000 and 60,000 and amounts of 0.02 to 1 is commensurate in scope for the claimed range.

It is further noted that while the examiner has criticized applicants' previous demonstrations of improved anti-fouling properties, applicants note that none of examples 2-1, 2-9 and comparative example 2-1 use a surfactant and therefore a meaningful comparison has been provided. The combination of a polymer and claimed with surfactant has been found to provide even greater anti-fouling performance as demonstrated by examples 2-2 to 2-8.

As applicants have discovered a ratio of quaternized amine monomer to second polymerizable monomer which provides improved antifouling performance, the claimed invention is clearly not obvious over the cited references and withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

The rejection of claims 3 and 12-16 under 35 U.S.C. 112, second paragraph is obviated by appropriate amendment.

Applicants have now amended claim 3 to recite an amount of monomer (A) of only 10 to 90 mol%, consistent with the claimed ratio of 2/3 to 0.9. In view of applicants' amendment, withdrawal of this ground of rejection is respectfully requested.

Application No. 10/500,469


Reply to Office Action of November 28, 2007.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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